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ENTOMOLOGICAL NEWS

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Some Records of Alaskan Acridoidea (Orthoptera)

By JAMES A. G. REHN, Curator of Insects, Academy of Natural Sciences of Philadelphia

In the Autumn of 1950 two small but interesting series of Alaskan grasshoppers were sent to me for identification and, in view of the scarcity of information relative to Orthoptera from that territory, the results of their examination are here presented. One series, sent to me by Dr. George H. Plumb, Assistant Entomologist of the Connecticut Agricultural Experiment Station, was secured by Dr. H. J. Lutz, of the Yale Forestry School; the other was largely secured and sent to me by Dr. Richard H. Washburn, Entomologist of the Alaska Agricultural Experiment Station of the University of Alaska at Palmer, Alaska. I have been privileged to retain the material secured by Dr. Lutz in the Academy series, as well as duplicate material from that sent by the Alaska Agricultural Experiment Station. One of the species here discussed was unreported previously from Alaska.

TETRIGIDAE

Tetrix granulata (Kirby)

Palmer; May 27 and June 18, 1950; (R. H. Washburn); 2 ♀; [Alaska Exper. Sta. and A.N.S.P.].

For the present at least, after the comparison of representative Old World series, I prefer to regard *granulata* of Kirby as distinct from the Palearctic *subulata,* under which the former was placed by Hebard.[1] I regard the case as less simple than

[1]Tech. Bull. 284, No. Dakota Agr. Coll., p. 27 (1936).

he stated, and believe that, until we have a better understanding of all the Palearctic forms related to *subulata,* it is most advisable to permit *granulata* to stand for the North American representative of the *subulata* species-group. The present material is fully in agreement with extensive representations from various parts of Canada, both east and west, and from the northern United States.

Hebard has reported this species from as far north as Dawson, Yukon, Canada,[2] and Fort Yukon, Alaska[3].

ACRIDIDAE

ACRIDINAE

Neopodismopsis[4] **abdominalis** (Thomas)

Fairbanks; July 25, 1850; 1 ♀; [Alaska Exper. Sta.].

This is the first record of this species from Alaska. Fairbanks represents one of the two extreme northern points from which the species is now known. In 1930 Hebard[5] reported a single female of this species from Fort Rae, Great Slave Lake, Mackenzie, Canada, taken July 6, 1927, by R. H. Bedford, which is the other extreme point from which I have seen the species, which ranges southward in the Cordilleran region to New Mexico, and broadly eastward across Ontario. The most northern British Columbian specimen known to me is a female, in the Academy series, from Besa River, one mile south of Neve's Cabin, Upper Peace River District, taken August 4, 1922, at 4,000 feet elevation, by Miss Josephine deN. Henry.

Chorthippus longicornis (Latreille)

Circle; July 23, 1950; 1 ♂; [Alaska Exper. Sta.].

I also have before me, in the Academy series, an immature male taken at Fort Yukon, Alaska, June 1916, by J. A. Kusche.

[2] Proc. Acad. Nat. Sci. Phila., LXXX, p. 221 (1928).

[3] Proc. Acad. Nat. Sci. Phila., LXXVII, p. 46 (1925).

[4] I am using the name *Neopodismopsis* of Bey-Bienko in a generic sense only tentatively, as I think its proper status will be found to be that of a subgenus under *Chrysochraon.*

[5] Proc. Acad. Nat. Sci. Phila., LXXXII, p. 383 (1930).

Weber has reported this species from Fairbanks, Alaska,[6] but the two localities here given are slightly more northern.

CYRTACANTHACRIDINAE

Melanoplus mexicanus (Saussure)

Fairbanks; July 25, 1950; 4 ♂, 5 ♀; [Alaska Exper. Sta. and A.N.S.P.].

Circle; July 23, 1950; 1 ♂, 1 ♀; [Alaska Exper. Sta.].

Big Delta; July 18, 1950; (R. H. Washburn); 2 ♂, 7 ♀, 1 juv.; [Alaska Exper. Sta. and A.N.S.P.].

Buffalo Center, Big Delta; August 4, 1950; (H. J. Lutz); 7 ♂, 3 ♀; [A.N.S.P.].

Bodenburg Butte; July 17, 1950; (H. J. Lutz); 3 ♂, 6 ♀, 8 juvs.; [A.N.S.P.].

Palmer; September 2–15, 1950; (R. H. Washburn); 1 ♂, 5 ♀, 1 juv. (Sept. 2); [Alaska Exper. Sta. and A.N.S.P.].

Near junction of Moose Pass-Hope Highway and Moose Pass-Kenai Highway (lat. 60° 32′ N., 149° 32′ W.), elev. 1,800 feet; August 26, 1950; (H. J. Lutz); 1 ♂, 5 ♀, 1 juv.; [A.N.S.P.].

I am referring these specimens to *mexicanus* without further specification, as that species appears to break up into a number of regional subspecies, aside from its gregarious migratory (*spretus*) phase. The exact determination of these subsidiary entities, for some of which names are already available, and the critical mapping of their respective distributional areas are matters for future study. Scudder's *Melanoplus alaskanus* has been regarded as an extreme condition of *M. bruneri,* but that is incorrect, and the name probably applies to a northwestern subspecies of *mexicanus.*[7] It is probable that previous Alaskan reports of *bruneri* really refer to the present species, the two frequently being confused.

Notes with the Bodenburg Butte series state the species was

[6] ENTOM. NEWS, LX, p. 121 (1949).

[7] Hebard (Proc. Acad. Nat. Sci. Phila., LXXX, pp. 281–282 (1928)) has given a concise and fully warranted discussion of the situation relative to the use of the name *alaskanus.*

there "abundant in sage brush and grass," while those from Buffalo Center are noted as having been "abundant on grass flats."

All of the adults here listed have reddish, pinkish or pinkish-buff caudal tibiae, except the single male from near the junction of the two highways, which has them in part muddy glaucous. Occasionally some have the tibiae reddish or pinkish only distad and infuscate proximad.

The adult material here listed can be grouped in two series on the basis of alar length; in one the alar organs, when in respose, exceed the apices of the caudal femora by a distance equal to, or nearly equal to, the length of the pronotum, while in the other these organs either do not exceed the femoral apices or at most by a very slight distance. All Big Delta and Buffalo Center individuals have the more ample flight organs, but several have them slightly shorter than the others from those localities. The Fairbanks series has three males long-winged, and one definitely in the shorter category, while of the five females but one is definitely in the long-winged grouping. All the other specimens here recorded have the alar organs of the shorter (or more normal) type, although the Palmer series has them rather longer than those from Circle, Bodenburg Butte or from the junction of the highways. It is possible these longer winged individuals indicate areal population pressure producing a *spretus* phase.[8]

The male individuals in the present series show a fair degree of variation in their external genitalia, but not more than is to expected from any representation of this species from equally diverse habitats. The male subgenital plate varies somewhat in its length, but it is never of the relatively distinctive *bruneri* type, and the apex is always markedly notched.

The material from Circle and Fairbanks is from near the northern limit of the distribution of this widely-ranging species. However, there are in the Academy series a single adult male,

[8] The comments of the late J. R. Parker relative to the direct effect of food on wing length in this species, written nearly twenty-five years ago, are well worth reading in retrospect. They were quoted by Hebard in 1928 (Proc. Acad. Nat. Sci. Phila., LXXX, pp. 283–284).

three adult females and nine immature individuals taken at Fort Yukon, Alaska (at lat. 66° 32′ N.), June 1916, by J. A. Kusche, which is, as far as known, the most extreme northern point for *M. mexicanus*.

Melanoplus fasciatus (F. Walker)

Fairbanks; July 25, 1950; 1 ♀; [Alaska Exper. Sta.].
Big Delta; July 18, 1950; 1 ♂; [Alaska Exper. Sta.].

I have also seen a female of this species taken at Rampart House, Yukon, Canada, August 25–29, 1912, by J. M. Jessup, in the Academy series, and a pair, in the same collection, from Cameron Bay, Great Bear Lake, Mackenzie, Canada, taken August 12, 1937, by T. N. Freeman, which probably represent the most northern known records for the species. Hebard had already reported it from Lake Sarah, Great Slave Lake, Mackenzie, Canada.[9]

A New Subgenus of Ambrysus from South America (Hemiptera: Naucoridae)

By Ira La Rivers, University of Nevada, Reno

PICROPS subgenus novum

The salient features of subgeneric importance separating *Picrops* from the subgenus *Ambrysus* can be summarized in the couplet—

Metatibia ventrally with more than 3 distal, transverse rows of spines, the terminal row longest, each row decreasing in length proximally; male possessing a short, lateral process on the sixth tergite ..... *Picrops*
Metatibia ventrally with 3 or less such rows; male lacking a short, lateral process on the sixth tergite ..... *Ambrysus*

At present, *Picrops* is known only from the single species, described below.

[9] Proc. Acad. Nat. Sci. Phila., LXXXII, p. 396 (1930).

Ambrysus usingeri species novum

General appearance: Quite markedly angular, with a tendency toward slimness for the genus; size, 9.0–9.5 mm. long, 5.0–6.0 mm. wide; dorsum moderately mottled in color, the lighter areas being pale yellow, the darker regions varying from brown-to-black, with an occasional deep reddish tinge; venter generally dull yellowish with no conspicuous mottling.

Head: Dorsally markedly triangular in form, the front margin (including eyes) broadly rounded; the posterior margin less sinuate in its insertion into the anterior edge of pronotum, but more in the shape of a very broad, rounded "V"; a deep reddish suffusion is often present in the eyes and along the front of the vertex; the centrum between the eyes may be yellowish with only faint and weak, small, pale brown markings, or may be entirely medium-brown with only a narrow border along the inner margin of each eye still showing in the background yellow color, 1.20 mm. long and 2.25 mm. wide. Eyes slightly protuberant, much darker than rest of head; shaped like an isosceles triangle, inner and outer margins being subequal and much longer than the hind margin (in the ratio of, respectively, 18::19::12); hind margins of eyes bordered by a well-developed chitinous bar which protrudes as a prominent angle at the postero-lateral corner of eye, and is a unique development, *Ambrysus melanopterus* being the only other member of the genus with even a suggestion of this protrusion. Labrum somewhat deeply semi-circular, with only a suggestion, at times, of any tendency to develop a point at the tip, length-to-width 23::33 (69%); deep reddish-brown in color, with a definite lighter, yellowish area at central base; mouthparts color of the yellowish area on labrum, or even lighter. Head ratios are:

1) total length to width (including eyes), 30::50 (60%)
2) outer eye-length to inner eye-length, 19::18 (95%)
3) anterior distance between eyes to posterior distance, 16::30 (53%)
4) posterior length of eye to anterior distance between eyes, 12::16 (75%)
5) posterior distance between eyes to greatest length of head posterior to this line, 47::18 (38%).

Pronotum: Angular in general form, flat, quite narrow, well-mottled with light-to-dark reddish-brown on a yellow background, in the more contrastingly mottled specimens with a

Ambrysus (Picrops) usingeri, × 6

pronounced suffusion of reddish along pronotal edges and in anterior portion of disc; posterior edge of pronotum conspicuously and characteristically with the wide, uniformly light-colored band, bordered anteriorly with the similarly character-

istic thin, black line; pronotal edges with two distinguishable darker areas anteriorly and posteriorly; postero-lateral angles sharp and abrupt, a line drawn through them coinciding approximately with the posterior thin, black transverse line, the angles markedly exceeding a right angle (varying between 100° and 120°); edges smooth, non-serrate, even under high magnification, lateral curvature weak, most pronounced in anterior half, becoming flat in posterior quarter (per cent of curvature, expressed in terms of straight-line distance between anterior and posterior lateral angles and greatest vertical distance between this baseline and line-of-curvature, is 10–12% (av. 13::120)); viewed cephalad or caudad, region of posterior angles slightly but definitely reflexed, thence rising abruptly, along posterior margin, over wing insertions, and continuing as a moderately plane surface to opposite side of pronotum, the curvature there being reversed; surface coarsely and shallowly punctate, the punctures becoming pit-like in the anterior central part behind greatest penetration of head and elongated, but never actually attaining a rugose condition so commonly seen in many species of the genus. Venter dull yellowish, occasionally with a roseate tinge along sides, and irregularly equipped with moderately long, yellow hair; ventral keel rounded posteriorly, rising anteriorly to a sharp point between procoxae.

Scutellum: Generally lighter at corners and in middle than over remainder of surface, although in dark specimens only the posterior angle may be lighter; surface rough, minutely punctulate; in pinned specimens in which the pronotum is in normal position, i.e., approximately on a plane surface with remainder of body, the ratio of the three sides, anterior and two laterals, is 58::41::42.

Hemelytra: Surface rough, minutely granulose, color a mottling of light and dark browns, the latter becoming black in dark specimens; membrane quite unicolorous; embolia narrow (length-to-width, 116::37 = 32%), light yellow in anterior two-thirds, darker in posterior part; line of color change perpendicular to the long axis of the body; hemelytra exposing lateral edges of connexiva which are yellow with a prominent

dark reddish-brown spot at the postero-lateral angles, conspicuously but minutely serrate along the edges, and strongly spined at the postero-lateral angles; the brown spot on each connexivum bears a series of yellow hairs which are much longer and more prominent than those arising elsewhere on the connexivum; hemelytra just attaining abdominal tip in length.

Venter: The prothoracic venter has been discussed above. Entire venter opaque-yellow, that of the abdomen minutely and densely clothed with a fine pelt of short, yellow hairs, the meso- and meta-sterna only thinly clothed with longer, yellow hairs; connexival spines well-developed on all segments except I, which completely lacks a spine; the spines increase almost imperceptibly in size from segments II to IV; the angle-of-curvature along the connexival edge from spine to anterior angle is even, with no abrupt deflection of the outline inward under the shadow of the preceding connexival spine; female subgenital plate well-rounded along the median line, becoming almost tubular in the posterior one-third, and narrowing quite markedly from base-to-apex; apex is strongly and angularly incised, the angle at base of incision approximately a right angle, while the lateral, terminal angles bordering the incisure are slightly more than right-angulate; male genitalia lacking the genital hook or process so typical of *Ambrysus,* and possessing a projection on the right side of tergite VI.

Legs. Prolegs: Coxa elongate-globular, yellow, occasionally weakly tinged with rose color on posterior surface, smooth; trochanter well-developed, smooth, yellow, with mat of short yellow hairs on anterior edge; femur smooth, yellow, widest near proximal end, narrowing rapidly to distal end, and with characteristic short, very dense mat of hairs along front border which serves as a resting groove for the tibia when closed against femur. Although the femur has the characteristic elongate-globular, swollen appearance of the genus (i.e., strongly incrassate), it is much slenderer, ratio of length to greatest width being 87::38 (44%) to 90::43 (48%), measured over the ventral surface; tibia very long and slender, smooth, yellow,

curved most strongly in distal portion where, with the single tarsal segment, it forms a continuous, curved, grasping instrument—combined tibia-tarsus—when closed, distinctly overlapping the union of femur and trochanter.

Mesolegs: Coxa long, narrow, dull yellowish, still somewhat globular, well-furred with very short, dense, yellow pile; greatest length of coxa lying parallel to median axis of body; trochanter large, distinct, smooth, yellow; femur very long, narrow, smooth, yellow, posterior edge sparsely beset with moderately long yellow hairs, most conspicuous towards base; ratio of length to median width of ventral surface is 92::10 (11%); length 2.55 mm.; tibia yellow, long, narrow, strongly beset with numerous reddish spines, arranged in series along the four rounded "angles" formed by the dorso-ventral compression of the tibia; distal end ventrally equipped with three transverse rows of spines set in a solid row across the width of tibia, each row overlapping the following, the last row set in the end of tibia; ratio of length to median width, 116::7 (6%); tarsus slender, smooth, yellow, three-segmented, terminating in two large, almost colorless claws.

Metalegs: Coxa swollen, globular, well-furred with short pile, dull yellowish; trochanter well-developed, smooth, yellow; femur long, narrow, smooth, yellow, ratio of length to median width 142::18 (13%), from ventral view, slightly narrower in middle than at either end, 3.0 mm. long; tibia thickly beset with brownish-red spines as in mesotibia, but spines longer, more prominent, and more evidently unequal in size, long and short spines alternating; at distal end, several transverse series of spines set in rows across width of tibia, 8 series being evident under strong magnification, the terminal series largest and widest, each series decreasing slightly in size until the 8th consists of a sole bristle; a very conspicuous, dense mat of very long yellow hairs arising from inner side; ratio of length to median width 187::9 (5%); tarsus slim, smooth, yellow, three-segmented, with two series of small, yellow spines and a dense mat of longer, yellow hairs beneath, terminating in pale yellowish claws.

Distribution: see types.

Type locality data: BRAZIL: *Rio Purus* (Lago Berury Region), (ix)35, A. M. Olalla.

Location of types: Holotypic male, allotype, one paratype (from type locality), one paratype (BRITISH GUIANA: *Honey Camp Creek,* 24(x)37, S. Harris) and one paratype (DUTCH GUIANA: *Republiek Coropina Creek,* 17(iv)44, D. C. Geijskes) in the Snow Museum, University of Kansas, Lawrence; one paratype each (from type locality) in the collections of Robert L. Usinger (Berkeley, California) and the writer (Reno, Nevada); one paratype (FRENCH GUIANA: *Cayenne,* no other data) in the Paris Museum, France.

The Cayenne specimen was found by Dr. Usinger in the Paris Museum where Noualhier, many years ago, had given it the manuscript name "Tapinocoris planisternis." A general discussion of group relationships within the genus *Ambrysus* is forthcoming in a paper now in press.

REFERENCE

LA RIVERS, I. *In press.* A revision of the genus *Ambrysus* in the United States (Hemiptera: Naucoridae). Univ. Calif. Publ. Entom.

Observations on the Habits of Certain Syrphids (Diptera)

By J. W. TILDEN, San Jose State College, San Jose, California

Eupeodes volucris Osten Sacken

This species seems to reach its greatest numbers early in the season. Larvae were taken in March and early April. Reared adults emerged in the laboratory in April. No parasites were reared from this species.

Scaeva pyrastri (Linn.)

This species reaches its peak late in April, with reared adults emerging as late as May 16. A parasite, *Diplazon laetatorius* (Fabr.), was reared from this fly.

Notes on Habits

These observations form a part of the work done on the insect associates of *Baccharis pilularis* D. C. (Compositae). The aphid, *Aphis helichrysi* Kalt., was the species used as food for laboratory observations on these syrphids. The habits of both the above species were quite similar, but unless otherwise stated, the observations pertain to *Scaeva pyrastri* (Linn.).

Oviposition was observed frequently in the field. The female hovers over the plants, dropping from time to time to inspect the branches. After locating an aphid colony, the female may feed on the honeydew. She may then oviposit either on the same or upon a nearby colony. Oviposition takes place usually during a brief pause as the fly hovers over the colony with down-curved abdomen, the egg partially extruded, and the egg is deposited during a brief landing on the tip of the plant.

Eggs are usually laid on the terminal buds. The egg is glistening white, elongated and pointed, fusiform, and is often partially embedded in the plant tissue. The presence of small syrphid larvae in an aphid colony may be suspected by the presence of the empty egg shell at the tip of the branch, and this simplifies the search for larvae.

Eggs are laid singly, but other females may oviposit in the same colony, or the same female may return and lay another egg later, which accounts for finding more than one egg in a single colony of aphids. Since cannibalism is common among syrphid larvae, usually only one of these eggs survives, the first to hatch eating the smaller larvae or the unhatched eggs.

Clausen (1940, pp. 394–395) gives two to three days as the normal hatching time of syrphid eggs. However, such eggs of *Scaeva* as were observed to hatch required four to six days. Many did not hatch at all.

The manner of larval feeding is not so simple as has been at times described, nor is the finding of prey entirely haphazard in spite of the blindness of the larvae. The larva has two pairs of papillae, one somewhat lateral to and the other slightly above, the mouth. Unpublished work by Carl E. Ludwig indicates

that these papillae are innervated, and that they are sense organs. They appear to be tactile in nature.

In feeding, the larva touches the anterior end of the body where these organs are located, to the surface of the plant. This process is repeated until some object, such as a living animal, an egg, or a cast skin, is located. This seems to produce a stimulus that incites the larva to feed, because the mouth hooks are then extended and the possible prey seized. The body wall of the prey is punctured and the mouth hooks are intruded. They are then moved with a sweeping motion toward the mouth of the larva. In most cases the prey is not lifted at first, but it is usually elevated near the end of the feeding. The extent of elevation is not the same in every case, and the most extreme lifting seems to occur while the larva endeavors to rid itself of the now empty skin of the victim.

As the body fluids are ingested, their course can be observed by watching the light line that marks the dorsum of the larva, and which is nearly transparent. Not only juices, but scraps of more solid flesh are swallowed, together with small bubbles of air. After the soft parts of the prey are removed, the mouth hooks can be seen to enter every part of the victim's body, even the coxae and the head capsule, until every available bit of tissue has been scraped away.

As the body of the prey is emptied, it telescopes against the head of the syrphid and at times to some extent enters its mouth. The mouthooks continue to act until only an empty shell of the victim remains. A certain amount of fluid is regurgitated by the syrphid and enters the body of the victim and flows through all of the body cavities, and is then reingested. This operation strongly suggests that extra-oral digestion may occur.

When the soft parts of the prey have been eaten, the crumpled exoskeleton protrudes from the syrphid's mouth, giving a grotesque effect. At last the skin of the prey is cast off by vertical movements of the anterior end of the syrphid's body.

Exuviae are often investigated and rejected when found to be empty. Any small animal may be eaten when encountered; the syrphid larvae are by no means selective in choice of food.

Chrysopid larvae experimentally introduced into vials containing syrphid larvae were in each case eventually eaten. Eggs of various species of insects were also attacked, including eggs of various moths and also of syrphids. Likewise, spider eggs seemed to be relished. Search for food is methodical and the syrphid gradually inspects every part of the twig on which it is placed.

The evident fact that aphids are the food most frequently eaten seems to be due to the place selected by the female fly for oviposition. How greatly this selection is based upon the feeding of the female upon the honeydew deposited by the aphids is not known, but whether correct in fact or not, it is tempting to infer that this trophobiosis is a factor in food selection by these flies. In any case, selection would appear to rest with the adult rather than with the larva, which is able to eat any available food of suitable size.

Some data on the number of aphids eaten by a single larva were obtained. Normal exuviae of aphids will not be confused with exoskeletons of prey, because of the contorted appearance of the latter. One larva ate 73 aphids, some of them quite small, in twenty-four hours. An inspection of the branch showed that but one aphid had been overlooked. This was a last instar larva of *Scaeva,* that pupated without further feeding. A much smaller larva of *Eupeodes,* in the penultimate instar, ate 23 aphids in 24 hours. A very small larva, instar unknown, ate 16 aphids in 24 hours. These latter figures seem to be a normal daily consumption, since many aphids remained available.

Development of the larvae under conditions of abundant food is rapid. First instar larvae taken on April 1 molted on April 3 and April 6 and pupated on April 10. Adults (*Eupeodes*) emerged on April 17 and 18. This checks well with the larval period of 9 to 10 days and the pupal period of 9 days given by Clausen (op. cit., p. 394). Larval life is similar in length in both *Scaeva* and *Eupeodes,* but *Scaeva* has a longer pupal period, in each case ten days.

In locomotion of the larvae three factors are involved. Firstly,

the body is capable of considerable extension and contraction and the slender tapering anterior end is hooked around objects and the remainder pulled forward. The mouthhooks may or may not be used as aids. This movement comprises the type referred to as "looping."

Secondly, the ventral projections function as prolegs. The anal pair often grasps a twig or leaf while the anterior part of the body investigates everything within its reach. If a suitable object is encountered, the cephalic end of the body fastens on to it and the looping movement is executed as usual.

Thirdly, viscous secretions from the anal disc are used to adhere to surfaces. It is by this means that the larvae are able to climb smooth objects. They were frequently observed to climb glass surfaces, but the process is more difficult for them than movements among foliage.

Aphids on *Baccharis* are quite temporary, due to the failure of new growth early in the season. For this reason, syrphids leave it early, and the plant is devoid of syrphids much of the year. Other plants with more continuous infestations of aphids form a reservoir from which *Baccharis* becomes reinfested with resumption of growth, and syrphids follow the aphids. The syrphids seem not to be adjusted phenologically to maintaining their yearly cycle on the aphids of *Baccharis* alone. The persistent habits of syrphid larvae in feeding, their general acceptance of many sorts of food, and their tendency to reduce competition by feeding on their competitors, all give clues as to why these flies are so successful. This is amply born out by their great numbers and evident dominance among the predators on aphids.

LITERATURE CITED

CLAUSEN, C. P. 1940. Entomophagous insects, first edition, McGraw-Hill Book Company, New York & London, x + 688; 1940.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

The Class Insecta Enlarged by the New Jersey Legislature. After January 1, 1952, the term "insect" may be legally used in New Jersey to designate a member of any of the following classes of animals provided it is "destructive, constitutes a liability and may be classed as a pest,"—*Onychophora* (Peripatus); *Crustacea* (lobsters, crayfishes, shrimps, crabs, sowbugs); *Palaeostracha* (horseshoe-crabs); *Arachnida* (scorpions, spiders, mites); *Pycnogonida* (marine arachnid-like arthropods); *Tardigrada* (bear animalcules); *Pentastomida* (worm-like parasitic arthropods); *Diplopoda* (millipedes); *Pauropoda* (minute centipede-like arthropods); *Chilopoda* (centipedes); *Symphyla* (small arthropods); *Myrientomata* (small elongate arthropods); and of course the class *Hexapoda* or insects. As if this were not enough—the word insect after January 1, 1952, in New Jersey also means "nematodes and other worms, or any other invertebrates which are destructive, constitute a liability, and may be classed as pests."

The occasion for this sweeping change in classification is an act relating to the manufacture, distribution and sale of insecticides, fungicides, and other economic poisons, approved July 17, 1951 and known as "The Economic Poison Act of 1951" (Chapter 316. Laws of 1951), which is administered by the New Jersey Agricultural Experiment Station.

The exact wording of the section defining an insect is as follows:—"The term 'insect' means a small invertebrate animal having the body more or less obviously segmented, for the most part belonging to the class insecta, comprising six-legged, usually winged forms, and includes beetles, bugs, flies, and to other classes of arthropods whose members are wingless and usually have more than six legs, including spiders, mites, ticks, centipedes, and wood lice, also nematodes and other worms, or any other invertebrates which are destructive, constitute a liability, and may be classed as pests."

According to this definition, lobsters, crabs, shrimps and "sow-bugs" if destructive, are insects. If not destructive they remain lobsters, crabs, shrimps and "sow-bugs."—H. B. Weiss.

A Method of Storing Spiders and Insects in Alcohol

The preservation of spiders and insects in alcohol has long been one of the curator's chief worries. Even though the vials are inspected every three to six months, a few usually become dry and the specimens are ruined. After being confronted with the task of filling a thousand vials the author felt a new system should be found to eliminate this time consuming process. Consequently, while on a tour through various museums during the summer of 1950 a special effort was made to study the techniques of curating alcoholic collections. The collections were of two general types: collective, where a number of vials are placed in one jar, and separate, where each vial is kept singly on a rack, or in a tray or by some other means.

The collective system, in which one or two layers of small shell vials were packed in a wide-mouthed jar, seemed to be the most practical for the storage of large numbers of vials. At the California Academy of Sciences the small vial consists of an open glass tube with a plug of cotton in the center and one at each end; the specimen is contained at one end and the lable at the other. The U. S. National Museum uses long shell vials plugged with cotton and stored in wide-mouthed jars of alcohol. Neither of these two systems allows for the maximum usage of space.

The writer has found that wide-mouthed jars $3\frac{3}{8}'' \times 4''$ high will hold forty 15×45 mm. shell vials in two layers. These jars, the same size as those in which many brands of peanut butter are sold, are obtainable at approximately one dollar per dozen from the wholesaler. The cardboard containers in which the jars are sold are very convenient for the storage of the jars.

Another practical size jar is a small mayonnaise jar $2\frac{3}{8}'' \times 4''$ which will hold sixteen 15×45 mm. shell vials.

A thin layer of cotton on the bottom of the jar and between layers will prevent breakage. If well packed, these jars can be shipped through the mails.

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Current Entomological Literature

COMPILED BY R. G. SCHMIEDER AND J. W. H. REHN

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the year 1951 unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For other records of general literature and for economic literature, see the Bibliography of Agriculture, Washington, and the Review of Applied Entomology, Series A, London. For records of papers on medical entomology see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c. is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Amaral, A. do—Codificação da nomenclaturs zoológica. [Arq. Zool. São Paulo] 7: 379–437. **Andree, K.**—Der Bernstein. Das Bernsteinland und sein Leben. Kosmos, Stuttgart, 1951, 96 pp., ill. **Bodenheimer, F. S.**—Insects as human food. Pp. 352, ill., W. Junk, The Hague, 1951, Dutch guilders, 10.—. **Classey, E. W. and H. S. Robinson**—Mercury vapour lamps: A plea for moderation. [30] 84: 239–40. Mercury vapour light traps. [Ent. Gazette] 2: 265–66. **Goldschmidt, R. B.—Eine weitere Bemerkung** über "Glühwürmer und Evolution." [Naturwiss.] 38: 437–38. **Grandjean, F.**—Les relations chronologiques entre ontogenèses et phylogenèses d'après les petits caractères discontinus des Acariens. [Bull. Biol. Fr. et Belg.] 85: 269–92. **Gray, P. H. H.**—A multiple reflector light trap. [Lep. News] 5: 72. **Monro, H. A. U.**—Insect pests in cargo ships. Canada Dept. Agric. Publication 855, pp. 1–45, ill. **Nielsen, A.**—Is dorsoventral flattening of the body an adaptation to torrential life? [Proc. Int. Ver. Theoret. Angew. Limnologie] 11: 264–67. (Summary and discussion.) **Peterson, A.**—Larvae of insects. Part II. Coleoptera, Diptera, Neuroptera, Siphonaptera, Mecoptera, Trichoptera. Pp. 1–416, 104 plates of figures. Lithoprinted, publ. by the author, Dept. Entomology, Ohio State Univ., Columbus, Ohio. $7.00. **Remington, C. L.**—Walter Richard Sweadner. [Lep. News] 5: 57–58 (Obit., portr.). **Solomon, M. E.**—Control of humidity with potassium hydroxide, sulphuric acid, or other solutions. [19] 42: 543–54. **Strenzke, K.**—Grundfragen der Autökologie. [Acta Biotheoretica] 9: 163–84. **Tischler, W.**—Zur Synthese biozönotischer Forschung. [Acta Biotheoretica] 9: 135–62 (English sum-

mary). **Travassos, L. (Filho)**—Líquido para preservação das estruturas internas de Lepidópteros e demais insetos que habitualimente se montam em alfinetes. [Arq. Zool. São Paulo] 7: 439–44. **UNESCO**—Scientific institutions and scientists in Latin America. Brasil (3 Vol.) Montivideo, 1951, pp. 1–230. **Williams, C. B.**—Comparing the efficiency of insect traps. [19] 42: 513–17.

ANATOMY, PHYSIOLOGY, MEDICAL—Baranyovits, F.—Fly reactions to insecticidal deposits; a new technique. [53] 168: 960–61. **Begg, M. and E. M. Packman**—Antennae and mating behaviour in Drosophila melanogaster. [53] 168: 953. **Bowen, R.**—Insects and allergic problems. [Southern Med. Jour.] 44: 836–41. **Brown, A. W. A.**—Studies of the responses of the female Aedes mosquito. IV. Field experiments on Canadian species. [19] 42: 575–82. **Charconnet-Harding, F. et C. Calet**—Teneur en trois vitamines du groupe B et en azote total de Drosophila melanogaster en fonction des stades du développment. [C. R. Acad. Sci.] 759–61. **Clausen, M. B. and A. G. Richards**—Studies on arthropod cuticle. VI. Intracellular and extracellular formation of cuticle in the developing posterior spiracular chamber of a blowfly larva (Phormia regina). [44] 89: 199–216, ill. **Cloudsley-Thompson, J. L.**—On the responses to environmental stimuli and the sensory physiology of millipedes (Diplopoda). [72] 121: 253–77. **Dobrovsky, T. M.**—Postembryonic changes in the digestive tract of the worker honey bee (Apis mellifera L.). [Mem. Cornell Univ. Agr. Expt. Sta.] 301: 1–59, ill. **Freire-Maia, N. and M. C. Porto**—Measures of sexual activity and mating preferences in Drosophila. [Dusenia] 2: 323–26. **Gray, P. H. H.**—Results of humidity tests with Papilio pupae. [Lep. News] 5: 67–68. **Gupta, G. C. Sen**—Effect of hosts on the egg coloration of the parasite Bracon gelechiae Ashm. (Hym., Braconidae). [53] 168: 793. **Harrison, R. A.**—Further studies on DDT-resistant houseflies in New Zealand. [Jour. Sci. and Tech., B] 33: 92–95. **Jordan, K. H. C.**—Autotomie bei Mesovelia furcata (Heteroptera). [Zool. Anz.] 147: 205–09. **Kennedy, J. S.**—Benefits to aphids from feeding on galled and virus-infected leaves. [53] 168: 825–26. **Kittrell, B. M.**—Tick paralysis. Report of a case. [J. Amer. Med. Assn.] 147: 1561–62. (Summary and map.) **Marks, E. P.**—Comparative studies of the male genitalia of the Hemiptera. [43] 24: 134–41, ill. **Mercer, E. H.**—Formation of silk fiber by the silkworm. [53] 168: 792–93. **Moretti, G. P. e F.**

Cianficconi—I "corpora allata" della larva di Limnophilus rhombicus (Tricotteri). [Boll. Soc. Ital. Biol. Sperim.] *27*: 771. Compartamento dei nuclei ramificati nella ghiandole sericigene delle larve dei tricotteri durante la secrezione. *Ibid.* 773. **Mukerji, D. and P. Sen Sarma**—Spermatheca in sucking louse (Anoplura). [53] 168: 612. **Peterson, A.**—Larvae. (See under General.) **Peterson, D. G. and A. W. A. Brown**—Studies of the responses of the female Aedes mosquito. III. The response of Aedes aegypti to a warm body and its radiation. [19] 42: 535–41, ill. **Portier, P. et R. G. Busnel**—Immunité relative de la chenille de Deilephila euphorbiae L. au poison des Euphorbes. Sensibilité du papillon à ce même poison. [C. R. Acad. Sci.] 233: 897–98. **Rehm, E.**—Ueber ein bisher unbekanntes Sinnesorgan der Honigbiene. [Zool. Anz.] suppl. 15: 112–16, ill. **Reichmuth, W.**—Reaktionsunterschiede bei Musca domestica und deren praktische Bedeutung. [Zool. Anz.] Suppl. 15: 170–78, ill. **Richards, O. W.**—The reaction to light and its inheritance in grain weevils, Calandra granaria L. (Col., Curcul.). [72] 121: 311–14. **Romanini, M. G.**—Attivita ialuronidasica del succo digestivo di Hydrophilus piceus. [Boll. Soc. Ital. Biol. Sperim.] *27*: 1079–80. Azioni istochimicamente rivelabili del succo digestivo di H. piceus su alcuni polisaccaridi. *Ibid.* 1081–82. **Schaerffenberg, B. und E. Kupka**—Untersuchungen über die geruchliche Orientierung blutsaugender Insekten. I. Ueber die Wirkung eines Blutduftstoffes auf Stomoxys und Culex. [Oesterr. Zool. Zeitschr.] 3: 410–24. **Schremmer, F.**—Die Mundteile der Brachycerenlarven und der Kopfbau der Larve von Stratiomys chamaeleon. [Oesterr. Zool. Zeitschr.] 3: 326–97, ill. **Schua, L.**—Der Einfluss des Wetters auf das Verhalten der Honigbiene. [Zool. Anz.] Suppl. 15: 183–86. **Sellier, R.**—La glande prothoracique des Gryllides. [Arch. Zool. Exp. Gen., Notes et Revue] 88: 61–72. **Shaw, J. T. B.**—Amino-acids of silk sericin. [53] 168: 745. **Smith, A.**—The effect of relative humidity on the activity of the tropical rat flea Xenopsylla cheopis (Siphonaptera). [19] 42: 585–99. **Walshe, B.**—The function of haemoglobin in relation to filter feeding in leaf-mining Chironomid larvae. [40] 28: 57–61. **Wykoff, D. E.**—Resistance of Anopheles quadrimaculatus Say fourth stage larvae to experimental drought. [Nat. Hist. Misc., Chicago] No. 89: 1–11.

ARACHNIDA AND MYRIOPODA—Archer, A. F.—A new species of Gasteracantha (Argiopidae) from São Tomé

Island, West Africa. [Nat. Hist. Miscell., Chicago] No. 90: 1–3. **Camargo, H. F. A.**—Descrição de dois alótipos e algumas anotações morfológicas sôbre arahnas brasilieras (Araneae). [Arq. Zool. São Paulo] 7: 445–63, ill. **Causey, N. B.**—On two new Colobognath millipeds and records of some established species from east of the Rocky Mountains. [63] 64: 137–40. **Cloudsley-Thompson, J. L.**—(See under Anatomy.) **Crabill, R. E.**—On the true identity of Geophilus huronicus Meinert and the presence of Geophilus longicornis Leach in North America (Chilopoda). [23] 83: 314–15. **Cromptom, J.**—The life of the spider. Houghton Mifflin Co., Boston, 1951, pp. ix–254. **Eibl-Eibesfeldt, I.**—Stammesgeschichtliche Reminiszenzen in der abdominalen Zeichnung einiger Spinnen. [Oesterr. Zool. Zeitschr.] 3: 398–409, ill. **Fuller, H. S. and G. W. Wharton**—The generic names Blankaartia Oud, 1911, and Trombiculoides Jacot, 1938. [73] 58: 85–88. **Grandjean, F.**—(See under General.) **Lipovsky, L. J.**—A washing method of ectoparasite recovery with particular reference to Chiggers (Trombic.). [43] 24: 151–56. **Schubart, O.**—Contribuição para a fauna do Estado de São Paulo. II. Os Rhinocricidae (Diplopoda). [Anais Acad. Brasileira Cien.] 23: 221–75, ill. **Soares, B. A. M. e H. E. M.**—Monografia dos gêneros de Opiloes neotrópicos. [Arq. Zool. São Paulo] 7: 149–39 (k). **Williams, E. C.**—An unusual aggregation of the milliped Zinaria butleri. [Proc. Indiana Acad. Sci.] 60: 329–31.

SMALLER ORDERS—Bonet, F.—Descripcion preliminar de especies nuevas del genero Eosentomon (Protura). ii. El E. pallidum Ewing y sus especies afines. [An. Esc. Nac. Cien Biol.] 6: 109–30 (k), 1949. **Denning, D. G.**—Records and descriptions of nearctic caddis flies. Part III. [43] 24: 157–62. **Edmunds, G. F., Jr.**—Western records of the mayfly genus Stenonema (Ephemerida). [43] 24: 162. **Holland, G. P.**—Notes on some bird fleas, with description of a new species of Ceratophyllus, and a key to the bird fleas known from Canada (Siphonaptera). [23] 83: 281–89, ill. **Lindberg, H.**—Strepsiptera. (See under Hemiptera.) **Mukerji and Sarma**—Anoplura. (See under Anatomy.) **Peterson, A.**—Neuroptera, Siphonaptera, Mecoptera, Trichoptera. (See under General.) **Ross, H. H.**—Phylogeny and biogeography of the caddisflies of the genera Agapetus and Electragapetus (Trichoptera, Rhyacoph.). [48] 41: 347–56, ill. **Schmidt, E.**—The Odonata of Madagascar Zygoptera. [Mem. Inst. Sci. Mad.] Ser. A, 6: 115–83. **Smith, A.**—Siphonaptera. (See under Anatomy.) **Stannard, L. J.**

—A new Sericothrips from Illinois (Thysanoptera). [43] 24: 129–30. **Werneck, F. L.**—Notas sobre malofagos (Gyropidae). [111] 11: 303–13, ill. **Young, F. N.**—Metajapyx subterraneus in Indiana (Aptera, Japygidae). [Proc. Indiana Acad. Sci.] 60: 332–33.

ORTHOPTERA—Burnett, G. F.—Field observations on the behaviour of the red locust (Nomadacris septemfasciata Serv.) in the solitary phase. Anti-locust Bull. No. 8: 1–37, ill. **Gurney, A. B.**—Praying mantis of the United States: native and introduced. Smithsonian Report for 1950, pp. 339–62. **Ramme, W.**—Zur Systematik, Faunistik und Biologie der Orthopteren von Südost-Europa und Vorderasien. [Mitteil. Zool. Mus. Berlin] 27: 1–431, 39 pls. **Rehn, J. A. G.**—Some additions to our knowledge of the Desmopterinae (Orth.: Acrid.: Prygom.). [62] 103: 211–36, ill.

HEMIPTERA—Beique, R. et A. Robert—Les Lygeides de la province de Quebec. [Ann. l'Acfas] 17: 147–50. **Beirne, B. P.**—Supplementary notes on the Canadian species of Cixiidae (Fulgoridae). [23] 83: 315–16. **Drake, C. J. and F. C. Hottes**—Notes on the genus Rheumatobates Bergroth (Heteroptera). [63] 64: 147–58 (*). A new Halobatinid from Mexico (Gerridae). *Ibid.* 141–44. **Heslop-Harrison, G.**—Preliminary notes on the ancestry, family relations, evolution and speciation of the Homopterous Psyllidae. [6] Ser. 12, 4: 1057–72. **Hottes, F. C.**—A new juniper aphid from western Colorado. [63] 64: 145–56. **Jordan, K. H. C.**—(See under Anatomy.) **Kennedy, J. S.**—(See under Anatomy.) **Kormilev, N. A.**—Notas sobre Colobathristidae neotropicales. II. Con la descripcion de dos especies nuevas. [111] 11: 333–39, ill. **Lindberg, H.**—On stylopization of Araeopids. [Acta Zool. Fennica] 57: 1–40 (Strepsiptera, Homoptera). **Marks, E. P.**—(See under Anatomy.) **Wygodzinsky, P.**—Descripción de géneros y especies nuevos de la familia Cryptostemmatidae. [111] 11: 259–70, ill.

LEPIDOPTERA—Almeida, R. F. d'—Ligeiras abservações sôbre o genero Cithaerias Hübner, 1819 (Satyr.). [Arq. Zool. São Paulo] 7: 493–505, ill. **Braun, A. F.**—The Aesculus-feeding species of Exartema with description of new species (Eucosmid.). [58] 61: 353–57. **Brown, F. M.**—Butterfly collecting in Colorado. [Lep. News] 5: 63. **Classey and Robinson**—(See under General.) **Forbes, W. T. M.**—A draft key to Epimecis (Geomtr.). [Lep. News] 5: 59–60. **Gray, P. H. H.**—(See under Anatomy and Gen-

eral.) **Kiriakoff, S. G.**—Recherches sur les organes tympaniques des Lépidoptères en rapport avec la classification. [Bull. Ann. Soc. Ent. Belg.] 87: 106–129. **Lambert, R.**—Étude des organes sexuels des papillons comme caractere taxonomique complémentaire. [Ann. l'Acfas] 17: 150–54 (Sparganothidinae). **McLeod, J. H.**—Notes on the lodgepole needle miner, Recurvaria milleri Busck (Gelech.), and its parasites in western North America. [23] 83: 295–301. **Mercer, E. H.**—(See under Anatomy.) **Munroe, E. G.**—The de Rabie paintings of Lepidoptera in the Blacker Library of Zoology, McGill University, with notes on the butterflies represented therein. [Lep. News] 5: 55–57. The geographic variation of Dasyuris polata (Duponchel) in North America (Geometr.). [23] 83: 290–94, ill. **Pastrana, J. A.**—Dos nuevas especies de Orneodidae de la Argentina y Paraguay. [An. Soc. Cien. Argent.] 152: 116–26, ill. **Pearson, H. R.**—Contribuição ao conhecimento do gênero Mimallo Hueb., 1920 (Mimallonidae). [111] 11: 315–32, ill. **Portier et Busnel**—(See under Anatomy.) **Travassos, L.**—(See under General.) **Travassos, L.**—Contribuição ao conhecimento dos Arctiidae. XXV. Sobre o genero Arctiarpia. [111] 11: 249–53, ill. **Viette, P. E. L.**—Contribution to the study of Hepialidae (25th note). On some new or little known species in the British Museum. [6] 4: 1272–82. **Williams, C. B.**—Seasonal changes in flight direction of migrant butterflies in the British Isles. [36] 20: 180–90.

DIPTERA—Bick, G. H.—The ecology of the mosquito larvae of New Guinea. [Pacific Science] 5: 392–431. **Brown, A. W. A.**—(See under Anatomy.) **Brues, C. T.**—A migrating army of Sciarid larvae in the Philippines. [73] 58: 73–76. **Carrera, M.**—Contribuição ao conhecimenyo dos Asilidae neotropicais. I. Sôbre as espécies brasilieras com esporão no tíbia. [Arq. Zool. São Paulo] 7: 1–14 (k), ill. **Darsie, R. F., Jr.**—Pupae of Culicine mosquitoes of the northeastern United States. [Mem. Cornell Univ. Agr. Exp. Sta.] 304: 1–45, 12 pls. **Knowlton, G. F. and E. H. Kardos**—Utah Heleidae. [43] 24: 163. **Lane, J.**—Neotropical Epicypta (Mycetoph.). [Dusenia] 2: 327–40 (k), ill. **Lane, J. and L. Whitman**—The genus Microculex in Brasil. [111] 11: 341–66 (k to adults and larvae), ill. **Lenz, Fr.**—Probleme der Chironomidenforschung. [Proc. Int. Vereinig. Theoret. Angew. Limnologie] 11: 230–45. **Lopez, H. de S.**—Sôbre o gênero Harpagopyga Aldrich (Sarcoph.). [111] 11: 275–88. **Mattingly, P. F., L. E. Rozeboom, K. L. Knight, H. Laven, F. H. Drummond, S.**

R. Christophers and P. G. Shute—The Culex pipiens complex. [88] 102: 331–82, ill. Introd. by P. F. Mattingly, separate articles by the other authors.) **McAlpine, J. F.**—A review of the North American species of Herina Rob. Desv. (= Tephronota Loew) (Otitidae). [23] 84: 308–14 (k), ill. **Peterson, A.**—Larvae. (See under General.) **Peterson and Brown.**—(See under Anatomy.) **Schaerffenberg und Kupka**—(See under Anatomy.) **Schremmer, F.**—Mouthparts. (See under Anatomy.) **Vanschuytbroeck, P.**—Dolichopodidae. [Explor. Parc Nat. Albert] Fasc. 74: 1–153. **Walshe, B. M.**—The feeding habits of certain chironomid larvae (Tendepedinae). [72] 121: 63–79. **Wykoff, D. E.**—(See under Anatomy.)

COLEOPTERA—Barber, H. S.—North American fireflies of the genus Photuris. [82] 117 (1): i–iv, 1–58. **Blake, D. H.**—A revision of the beetles of the genus Chalcosicya Blake (Chrysom.) from the West Indies. [20] 106 (7): 287–312, ill. **Bosq, J. M.**—Revision del genero Calydon Thoms. 1864 (Ceramb.). [An. Soc. Cien. Argent.] 152: 51–62. **Butt, F. H.**—Feeding habits and mechanism of the Mexican bean beetle. [Cornell Univ. Agr. Exp. Sta. Memoirs] 306: 1–32. **Fiedler, C.**—Neue südamerikanische Gasterocercus und Cylindrothecus (Curc., Cryptorh.). [Zool. Anz.] 147: 130–42. **Fritsch, R. H.**—Zur Biologie von Cicindela maritima Latr. [Zool. Anz.] Suppl. 15: 296–304. **Lane, F.**—Cerambicídos neotropicos. II. Sobre a posição sistemática de alguns gêneros. [Arq. Zool. São Paulo] 7: 363–78, ill. **Martinez, A.**—Notas coleopterologicas. V. La invalidez del nombre generico Pinotus Erich. y dos nuevas sinonimias (Scarab.). [An. Soc. Cien. Argent.] 152: 138–42. **Peterson, A.**—(See under General.) **Sanderson, M. W.**—Some generic synonymy in North American tortoise beetles with descriptions of two new species. [43] 24: 125–28.

HYMENOPTERA—Benoit, P. L. G.—Dryinidae. [Explor. Parc Nat. Albert] Fasc. 73: 1–18. Evaniidae. *Ibid.* 19–26. **Benson, R. B.**—Hymenoptera. 2. Symphyta, Sect. (a). Handbooks for the identification of British insects. 4 (2, a): 1–49. London. **Brian, A. D.**—The pollen collected by bumble bees. [36] 20: 191–94. **Brian, M. V. and A. D.**—Insolation and ant population in west Scotland. [88] 102: 303–330. **Creighton, W. S.**—Studies on Arizona ants. I. The habits of Camponotus ulcerosus Wh. and its identity with C. bruesi Wh. [73] 58: 47–64, ill. **Faester, K.**—Westeuropaische Sphegiden., L. Oxybelus Latr. Univ. Zool. Museum, Kobenhaven, 1949, pp. 1–46,

ill., 1949. **Gregg, R. E.**—Two new species of exotic ants. [73] 58: 77–84, ill. **Gupta, G. C. S.**—(See under Anatomy.) **Moure, P. J.**—Tres especies novas de Xylocopa Latr. (Apoidea). [Dusenia] 2: 317–22. **Orfila, R. N.**—Sinopsis de los Stephanus neotropicos, con descripción de una nueva especie de Argentina (Stephanidae). [111] 11: 271–74. **Ribbands, C. R.**—The flight range of the honey-bee. [36] 20: 220–26. **Robert, A.**—Notes biologiques sur les principaux insectes parasites des charancons de l'orme: Eubadizon magdali, Spathius canadensis (Bracon.), Trigoneura tarsata, T. sp. (Chalcid.). [Ann. l'Acfas] 17: 138–42. **Rozen, J. G.**—A preliminary comparative study of the male genitalia of Andrenidae. [43] 24: 142–50, ill. **Short, J. R. T.**—On the final instar larva of Aulacus striatus Jurine (Evaniidae). [28] 87: 272–74, ill. **Walley, G. S.**—Notes on Phanerotoma tibialis (Hald.) and P. fasciata Prov., with descriptions of two new species (Braconidae). [23] 83: 301–08.

Reviews

THE SUCKING LICE. By G. F. Ferris. Memoirs of the Pacific Coast Entomological Society. San Francisco, California, 1951. Vol. 1. ix + 320 pp., 124 figs. $6.00.

Professor Ferris has truly done a magnificent piece of work in his latest monograph. In brief, it may be said that this will be the definitive monograph on the Anoplura for many years to come, in conjunction with his "Contributions Towards a Monograph of the Sucking Lice." In the field of insect ectoparasitology, it meets its equal only in Dr. F. L. Werneck's "Os Mallofagos de Mamiferos."

The first fifty pages are devoted to a comprehensive survey of the morphology of the order based on three representative species. This section is based upon the able work of C. J. Stojanovich. Following this is a brief survey of the taxonomic status of the group and the views of Dr. Ferris on maintaining the Anoplura as a separate order from the Mallophaga. A new system of family classification is established, and with our present knowledge of the group, it seems to be quite acceptable.

Most of the remainder of the book consists of a review of the families, subfamilies, genera, and species of the order. Each family is briefly characterized; then generic and specific keys are given. An outstanding feature of the book is that the type species of each genus is illustrated by a one or two page plate. There are also illustrations, in the same fine detail, of the species of economic importance, so this book should be of interest to

the economic entomologist as well as to the taxonomist. Each species is listed with a partial synonomy (the entire one may be found in the earlier works of Dr. Ferris), followed by brief notes on hosts, distribution, and various taxonomic details. The final section consists of a host list and a concise essay on the zoogeography.

For students of evolution, the section on "The Problem of the Pediculi of Man" should be of great interest. Dr. Ferris' definition of the species is in essence comparable to those stated by such workers as A. E. Emerson and Sewall Wright. His treatment of *Pediculus humanus* Linnaeus is to consider it as a single species, with no division into subspecies for the so-called "head" and "body louse." From the comprehensive evidence presented, it seems at best, these two forms might be the extremes of a cline. Lice from any one relatively isolated population of man do present certain differences analogous to the host differences. But when lice from another population are examined, they possess their own slight variations, and also exhibit, within the normal range of variation, features of other groups. As the author points out, the entomologist has the same difficulties in the nomenclature within this species as the anthropologist has with man. The most puzzling situation of all exists in *Pediculus pseudohumanus* Ewing, described from a New World monkey, subsequently recorded from various neotropical Indians (including "dried head from Ecuador") and natives of Tahiti, and the Marquesan Islands. Is this form a distinct species, and if so, how did it acquire the peculiar distribution; or is it the result of random fixation of small isolated populations of *P. humanus* culminating in accidental similarity?

Though the bibliography is considered as closed July 1, 1951, several papers issued prior to that date are inadvertently omitted (Büttiker,[1] Sasa,[2] and Dubinin[3]). Dubinin's Russian paper is of special interest, as it contains the first report of a fossil Anopluran, *Neohaematopinus relectus* Dubinin, recorded from *Citellus glacialis* Vinogradov, a frozen Pleistocene fossil from the Indigirka River Basin of Siberia (64° 2′ N., 142° 0′ E.). Careful comparisons of the figures of this species with that of *N. laeviusculus* (Grube) from a closely related extant species, *Citellus eversmanni* (Brandt), show no good morphological criteria for their separation. If we use the definitions of the "New Systematicists," they would be considered as one distinct species due to the presumed genetic continuity of approximately one

[1] Büttiker, W. 1949. Acta Tropica 6: 158–60, 6 figs.

[2] Sasa, M. 1950. Jap. J. Expt. Med. 20: 715–17, 2 figs.

[3] Dubinin, V. B. 1948. Akad. Nauk SSSR Doklady (Nov. Ser.) 62: 417–20, 3 figs.

million years. If presumably genetic distinctions can be demonstrated, a better term might be "chronocline" as used by Huxley.[4]

In a recent paper by Brinck[5] several interesting points are brought up which are not considered by Dr. Ferris. The distribution of a species may be homotopic or heterotopic, i.e., present throughout the host range, or occurring in only part of the host range. Data are presented for several species to verify these assertions. A further point that Brinck makes is that a eurytopic species has far greater evolutionary potentialities than a stenotopic species, though further evidence is necessary for the verification of this hypothesis.

"The Sucking Lice" fulfills a long vacant gap in the field of entomology, and Dr. Ferris is to be congratulated upon accomplishing this goal in such a fine manner.

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ELEMENTS OF PLANT PROTECTION. By Louis Pyenson. John Wiley and Sons, Inc. New York, Chapman and Hall Limited, London, England. 1951. $4.96.

This volume is a text book on the elements of plant protection. It is sketchy, and at least from an entomological standpoint, incomplete. For instance, the word "phytotoxicity" does not appear either in the glossary or the index. Neither does the word "toxicity," yet the problem of phytotoxicity in relation to insecticides used for insect control is extremely important.

At most, it is a good outline for a course in plant protection, touching as it does, on mammals, plant diseases, birds, insects, other arthropods, and other things affecting plants. After exhausting it as an outline, one would start building the course on outside material.

One criticism I have of the book is that Mr. Pyenson succeeded in making the simple complicated. Take as an example the sentence "A diseased plant may be defined as one that is continuously being irritated by a causal factor that upsets the normal activity of cells or organs so as to produce visible evidence of disease in the form of characteristic symptoms."

Farther along he states "No plant species or variety exists that is free from disease." I sincerely wish that plant pathology were far enough advanced to make such a statement.—DOUGLASS BURNETT, JR.

[4] HUXLEY, J. S. 1939. Bijdr. Dierk. 27: 491–520.

[5] BRINCK, PER. 1948. Opuscula Ent. 1948: 129–56, 3 figs.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Miridae (Capsidae)—American species wanted, with locality labels, in exchange for British species. D. Leston, F.R.E.S., 6 Frognal Rise, London N. W. 3, England.

Wanted—Entomological microscope in good condition; Spencer, Bausch & Lomb, or other standard make. David G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Coleoptera—Large quantities of Cicindelidae, Buprestidae, Lucanidae, Cerambycidae wanted in exchange for all families of Coleoptera from Ill., Ind. and Mo. Joseph B. Hayes, 1905 N. Pulaski Rd., Chicago 39, Ill.

American Sarcophagidae—wanted for identification. H. R. Dodge, P.O. Box 185, Chamblee, Georgia.

German lepidopterist wishes to correspond and receive live material (eggs and pupae) in exchange for dried imagoes. Johannes Reichel, Koenigsberg, Krs. Wetzlar 16, Germany.

For exchange—The periodic Cicada, T. septendecim. Desire Lepid., espec. Papil., Sphing. & Speyeria. Also Col., espec. Ceramb. & Lucan. John W. Morris, 2704 Genesee St., Syracuse 9, N. Y.

Cynipid and Itonidid galls—American species wanted; purchase or exchange for British species. Fresh or dried. D. Leatherdale, F.R.E.S., Old Woodstock, Oxford, England.

Wanted—Reprints or papers concerning insects taken in Alaska for inclusion in list of Alaskan insects. R. H. Washburn, Alaska Experiment Station, Palmer, Alaska.

Conopidae of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

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